

## Wood Science Meeting the 21st Century

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Wood science is a biological, chemical and physical science, which studies on lignified natural materials and their derivatives. It provides scientific basis for the techniques of the efficient use of ligneous materials and forest management.

Further research and development of wood science will encourage the rational processing and efficient use of forest resource, the creation and development of multi-function and quality wood products and ligneous material products, the improvement of human beings living standard. It proves that wood science is closely related with forest industry. Forest industry consists of forest management, the processing of forest product, multiple management and others. Among those, the processing of forest product is the top first and essential one in forest industry. Its output value is about 77% of the total values of forestry in the world, which is up to 91% in some developed countries.

It is the general tendency that China's forestry should pay attention to the future and the 21st century. China's forestry will keep on improving the techniques of living woods management, gradually realize intensive management, produce forest product with high quality and high appended values by applying new processing and new equipment, to provide technical basis for the efficient use of forest resource.

To meet the next century, the major topics and some important items about China's wood science in forestry industry are as follows:

### **Intensive Management and Quality Optimization of Wood**

In order to realize intensive management of woods, it is necessary to artificially choose seeds, cultivate seedlings and select seed resources in the growth of woods. Some management methods and techniques such as thinning, pruning, weeding, fertilizing, irrigating, diseases, pests and rats preventing are needed. The main purpose of this research is to focus on both quantity and

quality of wood through the growth and stand changing in planting forests. We aim at high quality and high yield woods by optimizing and improving techniques. We can grasp the laws of wood quality variation of fast growing forests, high yield and short period industrial forests to predict the wood quality of plantations at early stage by analyzing wood quality in growth rings. The best rotation is determined by the uses of wood. This research is based on the laws of wood property variation and quality valuing, combining forest management with wood processing and utilization. It plays an important role the high quality, high yield and efficient sustainable development of China's forestry.

### **Efficient Use of Wood-Based Composite Materials**

Because of the changes of China's forest resource structures, the exhausting of quality and large natural wood, the declining of the number of countries and regions where could provide quality and large wood on international markets, the trend of the product constructions in China's forestry industry is to develop the products from fast growing plantation wood, small wood, inferior wood, bamboo wood and others, so to replace the products solely depending on large natural wood. More and more problems about the timber size, low quality and efficiency are presenting because of the changing of raw materials. It is the cynosure throughout the world to increase the value of wood by using small and inferior wood. In the 21st century, wood supplies will not meet the demands. It is necessary to create some new materials with quality, multi-function and high appended values to meet the demands of living and social development. Among which, the research and development of wood-based composite are important in realizing efficient use of wood. Wood-based composites are divided into laminated composite, mixed composite and produced composite according to the composting forms of itself and with other materials. The most

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typical ones are laminated veneer, integrated wood and plywood in laminated composite. There are cement shaving board, gypsum shaving board, slag shaving board and reed & fiber composting board in mixed composites. In produced composites, there are inorganic, metal, plastic composites and others. Those wood-based composite materials obtained through various composting types take great advantages over the original raw materials. We can say that more types of new composite materials will be produced, among which, the intelligent composite materials will be more and more popular.

#### **Protection of Wood and Modification of Wood Quality-New-Modeled Wood.**

Wood is a natural biological material with many qualities, such as visual, tactile, hearing and regulating characteristics (conditioning, temperature adjusting and biological adopting). As construction materials, durability, size stability, high rigidity and strength are

needed besides above characters.

Some marvelous functions and needed under special conditions. However, wood itself lacks these characters. In recent years, physical, chemical, biological and mechanical methods are applied to improve wood and the wood was endowed with some new functions, some features are improved for special uses. So produced the New-modeled Wood, whose quality is quite different from the original raw wood, but it is still based on wood, such as molded wood, fire retarding wood, non-rotten wood, reconstructed wood, crooked wood, compressed wood, dyed wood, shaped wood and many many others.

Meeting the 21st century, more types of New-modeled Wood will be produced in order to realize the scientific processing and efficient use of wood with the progress of new and high techniques & the development of human society.

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